

REMARKS/ARGUMENTS

The Pending Claims

Claims 1-30 currently are pending. The pending claims are directed to fumed metal oxide particles and a process for producing the same. Reconsideration of the claims is respectfully requested in view of the remarks herein.

Discussion of Claim Amendments

Claim 1 has been amended to explicitly recite the reactor and particular process steps as disclosed in the specification at, for example, paragraph 0030 and in the Figure. No new matter has been added by way of the claim amendments.

Summary of the Office Action

The Office Action sets forth the following obviousness rejections under 35 U.S.C. § 103:

(a) claims 1-5, 7-10, and 13-30 as allegedly obvious over U.S. Patent 5,340,560 (Rohr et al.) in view of U.S. Patent 5,256,389 (Jordan et al.), U.S. Patent 6,312,656 (Blackwell et al.), or U.S. Patent 5,904,762 (Mahmud et al.),

(b) claim 6 as allegedly obvious over the same combination of references indicated above with respect to claims 1-5, 7-10, and 13-30, with the addition of U.S. Patent 4,822,410 (Matovich),

(c) claims 11 and 12 as allegedly obvious over the Rohr '560 patent in view of U.S. Patent 5,075,090 (Lewis et al.) and any one of U.S. Patent 6,565,823 (Hawtof et al.), the Blackwell '656 patent, and U.S. Patent 4,857,076 (Pearson et al.),

Applicants request reconsideration and withdrawal of these rejections for the reasons set forth below.

Discussion of the Obviousness Rejections

Process claims 1-24, as amended, recite that the liquid feedstock is injected into the steam of combustion gas (a) which is formed from the combustion of the oxidant and liquid or gaseous fuel in the combustion chamber of the reactor and (b) while the stream of combustion gas is flowing through a constricted outlet portion of the reactor. The stream of combustion gas atomizes the liquid feedstock, and the stream of combustion gas subjects the atomized liquid feedstock to a sufficient temperature and residence time in the stream of combustion gas for the liquid feedstock to combust or pyrolyze and thereby be converted to fumed metal oxide particles. Product claims 25-30 recite the product resulting from the claimed process.

The Office Action primarily relies on the Rohr '560 patent, which discloses a conventional process for preparing fumed silica. As acknowledged by the Office Action, the Rohr '560 patent does not disclose or suggest the injection of the liquid feedstock into the stream of combustion gas formed from the combustion of the oxidant and liquid or gaseous fuel so as to atomize *and* combust or pyrolyze the liquid feedstock to form fumed metal oxide particles. This distinction has been further highlighted by the claim amendments set forth herein, which seek to more completely recite the inventive process by referencing the reactor and process steps relative thereto, especially the fact that the liquid feedstock is injected into the stream of combustion gas as the stream of combustion gas flows through a constricted outlet portion of the reactor.

The Office Action seeks to remedy the deficiencies of the disclosure of the Rohr '560 patent by relying on the Jordan '389 patent, the Blackwell '656 patent, the Mahmud '762 patent, the Matovich '410 patent, the Lewis '090 patent, the Hawtof '823 patent, and/or the Pearson '076 patent. However, none of these references teaches or suggests the injection of a liquid feedstock into the stream of combustion gas formed from the combustion of the oxidant and liquid or gaseous fuel, let alone as the stream of combustion gas flows through a constricted outlet portion of the reactor, so as to atomize *and* combust or pyrolyze the liquid feedstock to form fumed metal oxide particles.

Indeed, these secondary references do not even relate to the preparation of fumed metal oxide particles. In particular, the Jordan '389 patent pertains to the preparation of a

foamed particle; the Blackwell '656 patent pertains to the preparation of amorphous soot; the Mahmud '762 patent pertains to the preparation of a dual-phased carbon/silica particle; the Matovich '410 patent pertains to a high-temperature chemical reaction process for the reclamation of metals; the Lewis '090 patent pertains to the preparation of calcined metal oxide particles; the Hawtof '823 patent pertains to the preparation of fused silica glass; and the Pearson '076 patent pertains to the production of synthetic gas or fuel gas.


The Office Action asserts that particularly the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent teach at least the general concept of the atomization of a feedstock by a combustion gas. However, there is nothing in these or any of the other references of record that would cause one of ordinary skill in the art to reasonably believe that (a) the general concept of atomization of a feedstock by a combustion gas would be applicable to the preparation of fumed metal oxide particles or (b) such an application of the general concept of atomization of a feedstock by a combustion gas to the preparation of fumed metal oxide particles would actually allow for the production of fumed metal oxide particles. Indeed, as discussed in the accompanying Declaration Under 37 C.F.R. § 1.132 of Yakov E. Kutsovsky, the process parameters involved with the preparation of a foamed particle, amorphous soot, and dual-phased carbon/silica particles as disclosed in the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent, respectively, differ in significant respects from the process parameters involved with the preparation of fumed metal oxide particles as disclosed, for example, in the Rohr '560 patent, such that one of ordinary skill in the art would *not* have reasonably utilized the process parameters disclosed in the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent to modify the process for preparing fumed metal oxide particles as disclosed in the Rohr '560 patent to arrive at a modified process with any *reasonable* expectation of successfully preparing fumed metal oxide particles.

Under the circumstances, the combination of the cited references fails to render obvious the present invention as defined by the pending claims in the absence of any improper hindsight knowledge of the present invention. Accordingly, the obviousness rejections based on various combinations of the cited references should be withdrawn.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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